STATE OF COLORADO

Zuber - DNR, Rob <rob.zuber@state.co.us>

Midterm Findings and RCE for Keenesburg Strip Mine

1 message

Zuber - DNR, Rob <rob.zuber@state.co.us> Thu, Apr 25, 2024 at 3:04 PM
To: "Moline, Ben" <ben.moline@molsoncoors.com>

Hi, Ben -

Please see the attached Findings and Division cost estimate (enclosed at end of Findings).

Because the total required surety has increased by $43,409, we are planning on issuing a Surety Increase (SI) for this permit. However, let me know if you have questions or comments regarding the cost estimate. I will wait for your response before issuing the SI.

Thanks,
Rob

Rob Zuber, P.E.
Environmental Protection Specialist
Active Mines Regulatory Program

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

I am working remotely and can be reached by cell at 720.601.2276.
Physical Address:
1313 Sherman Street, Room 215
Denver, CO 80203
Mailing Address:
Division of Reclamation, Mining and Safety, Room 215
1001 East 62nd Avenue
Denver, CO 80216
rob.zuber@state.co.us | http://drms.colorado.gov

C1981028_MT8_DRMS_Findings_with_RCE.pdf
914K

MIDTERM PERMIT REVIEW (MT- 08)
for
Coors Energy Company

Keenesburg Strip Mine

Permit No. C-1981-028

COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

April 25, 2024

Michael A. Cunningham, Director

Prepared by Robert D. Zuber, P.E.
Environmental Protection Specialist

In Fulfillment of C.R.S. 34-33-115 and the following
Regulations of the Colorado Mined Land Reclamation Board for Coal Mining:
Rules 2.08.3, 2.06.2, 2.06.3, 2.06.5, 2.06.7 and 3.02.2

Introduction

This document presents the results of the Midterm Review of the Keenesburg Strip Mine permit, conducted by the Colorado Division of Reclamation, Mining and Safety (Division). The Keenesburg Strip Mine is owned and operated by Coors Energy Company (CEC). This Midterm Review was conducted to fulfill the requirements of the *Colorado Surface Coal Mining Reclamation Act* (Act), and Rules 2.08.3, 2.06.2(9), 2.06.3(4), 2.06.5(3), 2.06.7(5), and 3.02.2(4) of the *Rules and Regulations of the Colorado Mined Land Reclamation Board for Coal Mining* (Rules), which were promulgated to implement the Act.

Rule 2.08.3 requires that the Division conduct a review of each permit issued not later than the middle of the permit term. Based on this review, for good cause shown, the Division may require reasonable revisions to, or modifications of, the permit provisions to ensure compliance with the Act and Regulations.

Rules 2.06.2, 2.06.3, 2.06.5, and 2.06.7 require that during the midterm review, where applicable, experimental practices, mountaintop removal variances, variances from approximate original contour (AOC), and variances from contemporaneous reclamation, respectively, be reviewed by the Division.

Rule 3.02.2(4) requires that the Division review the amount of performance bond liability and the terms of acceptance of the bond every 2½ years.

This Midterm Review consisted of a detailed review of the Keenesburg Strip Mine permit application package (PAP) and previous Division findings of compliance to ensure that the proposed operation is in compliance with the Rules and Act. The Division also reviewed all subsequent revisions and stipulation responses to ensure that all permit commitments and conditions were being followed. Potential issues and observations from past Division inspection reports were also considered.

The document has seven sections:

- Section I contains a brief description of the mine history and the surrounding environment.
- Section II contains a summary of permit actions since the last Permit Renewal.
- Section III is a summary of the Division's review of the active stipulations attached to the permit.
- Section IV is a summary of the review of any previously approved experimental practices, mountaintop removal variances, variances from approximate original contour (AOC), and variances from contemporaneous reclamation.
- Section V summarizes any enforcement actions issued since the permit was last renewed, and the current status of any actions that were issued.
- Section VI is a summary of the review and a discussion of any potential issues identified as a result of this review that are required to be resolved.
- Section VII is a summary of the review of the reclamation cost estimate and the performance bond(s) held by the Division.

Section I - Mine History and the Environment

Mine Status and History

The Keenesburg Strip Mine is nearing the final phases of reclamation.

Coal extraction operations began in 1980 and ceased by 2001. During active surface coal extraction, the Number 7 Seam of the Laramie Formation was mined.

Previous activity at the site included the controlled disposal of ash and mine waste rock as a portion of the backfill of mine pits. The importing of ash was completed by CEC in April 2016.

Some information on the mine's environment, operations, and reclamation activities are provided below. More detailed information about the mining and reclamation operations can be found in the PAP on file at the Division offices, located at 1313 Sherman Street, Room 215, in Denver, Colorado.

Description of the Environment

The Keenesburg Strip Mine is located on private lands within Weld County, Colorado. It is approximately six miles north/northeast of the town of Keenesburg within Section 25, Township 3 North, Range 64 West of the 6th Principal Meridian.

The current permit boundary contains approximately 226 acres. According to the 2023 Annual Reclamation Report, approximately 443 acres have been disturbed over the life of the mine. Per records for bond releases, approximately 263.7 acres have been previously approved for Phase III bond release at the Keenesburg Strip Mine.

Geology, Soils and Topography

The permit area is located on level to gently rolling topography consisting of fine sand, which is wind-deposited material overlying weathered residual shale. The sand varies in depth from about 5 feet to 20 feet, is highly to moderately permeable, and is highly susceptible to wind erosion. The flat-lying Number 7 coal seam was overlain by 60-180 feet of overburden consisting of yellow-brown and gray to blue gray soft carbonaceous shale and clay interbedded with sandstone and shaley sandstone. At the base of the Laramie formation is the Fox Hills member, a cross-bedded gray to buff sandstone, which is slightly or well cemented.

Surface and Groundwater

Because of the low relief and deep, well-drained soils, there is virtually no surface runoff. No streams, springs or seeps exist in the area. All water flows subsurface through aeolian deposits to Ennis Draw, a topographic swale (ephemeral drainage) located along the eastern boundary of the permit area. Ennis Draw appears to be a complex, braided, ancient stream bed that has been covered by windblown sand. The draw discharges several miles to the north into Box Elder Creek.

Groundwater moves laterally toward the northeast, and apparently discharges into the sands and stream deposits in Ennis Draw.

At the time the mine was originally permitted, groundwater in neither the coal nor overburden was known to provide a water supply for any purpose in the vicinity of the mine. Since that time, groundwater is being drawn for industrial uses at the mine, and several other wells have been drilled in the vicinity of the mine (per a review of State Engineer Records). However, no adverse impact from the mine has been observed or is expected, due to the geologic and hydrologic conditions of the site.

Climate

The mine site is situated in an area which has a "continental" type of climate, characterized by low relative humidity, a large amount of sunshine, light rainfall, moderately high winds, and large daily range in temperature. Average monthly temperatures are presented in the following table. The data are from Weather Trends (https://www.weathertrends360.com). These data are all within a couple degrees of data for Brighton, Colorado from the Western Regional Climate Center (wrcc@dri.edu), which is affiliated with NOAA and a leading authority on Colorado weather and climate. (WRCC data does not include an extensive dataset for Keenesburg itself.)

Average Monthly Temperature at Keenesburg, Colorado

(All values in degrees Fahrenheit.)

	J	F	M	A	M	J	J	A	S	O	N	D
Average high	45	47	57	63	72	84	90	87	80	67	55	45
Average low	19	21	28	35	44	53	59	57	49	38	27	19

For the years 2008 through 2023, annual precipitation ranged from 8.31 to 21.88 inches with a mean of 14 inches (from National Weather Station data for nearby Brighton, Colorado).

Vegetation, Wildlife and Land Use

The undisturbed lands in the permit area are moderately to well stabilized by a sandsage-prairie sandreed plant association that is used primarily for grazing by cattle in summer months.

Using the United State Fish and Wildlife Service's (USFWS) IPaC program available through the USFWS website, there are three endangered plant species that have the potential to be found within the permit area. These species include Colorado Butterfly Plant, Ute Ladies' Tresses Orchid, and Western Prairie Fringed Orchid.

Wildlife is limited to small rodents, primarily field mice, and birds, including an owl that is often seen at Sediment Pond 2. Deer and pronghorn are rare, as are most higher order vertebrates, but pronghorn and coyotes have been seen at the site. There are no known threatened or endangered animal species, nor habitats for these species, in the area. The IPaC program states that there are no critical habitats within the permit area.

The premining land use classification of the area was rangeland, as shown on the general soil map of Weld County (from the Soil Conservation Service and included in the Permit as page 37). The current

postmining land use of the permit area is also rangeland. The land cannot support a variety of uses under existing technologies and local resources. All attempts at dryland farming on the area have been abandoned. It should be noted that the CEC representative, Ben Moline, has indicated that CEC intends to submit a Permit Revision in 2024 to alter the postmining land use for a portion of the site to commercial.

The premining soil capability class is VIe for irrigated and non-irrigated Valent soils. Osgood soils have capability classes of IVe for irrigated crops and VIe for non-irrigated conditions.

Description of the Operation and Reclamation Plan

Mining activities and ash disposal activities have been terminated at the site. Most of the site reclamation has been performed, including the spreading of topsoil (referred to as topsand in CEC's permit) and seeding.

Topsoil Stripping and Replacement Depths

No further stripping of topsoil or topsand is anticipated at the site. Only reclamation activities are anticipated. Replacement depths of topsand are:

- Two feet over overburden spoil cover (on ash disposal areas)
- Two feet over roads
- Fifteen inches over the long-term spoil area
- Six inches over facilities and topsand storage areas.

Revegetation Techniques

The approved revegetation plan emphasizes native species planting resulting in a diverse, permanent, effective plant community capable of self-regeneration. The current seed mix is included in Section 2.05.4 of the PAP.

Manure or organic mulch is to be spread on the topsand. The approved seed mix will be drill seeded through the organic mulch. Small areas that require reseeding may be broadcast. Two seeding windows exist:

1. March 15 to June 1 (spring) and
2. September 15 to December 15 (fall).

A stubble mulch (e.g., sorghum) may be applied in the spring or fall prior to seeding of the permanent seed mix. Hay/straw mulch, hydromulch and tackifier, soil amendments, and compost products may also be used. No irrigation is proposed.

The site is currently inspected at least quarterly for pests and diseases. No infestations of pests or noxious weed species have been identified.

Grazing is prohibited during the first two years of vegetation establishment on reclaimed areas. Grazing may be allowed thereafter. Grazing will not be allowed to interfere with vegetation sampling

for monitoring or bond release purposes, and eligible areas will not be grazed during the growing season prior to sampling.

Revegetated areas that have experienced three or more growing seasons are monitored for success standards of cover and production. Eligible areas are sampled in the last two consecutive growing seasons prior to final bond release, but not earlier than years nine and ten of the extended liability period.

Disposal of Waste

There are no coal processing wastes or mine development wastes on site, nor will any be generated by current or anticipated future activities. Non-coal waste generated by demolition of facilities was placed in the pits between the limits of five feet above the local ground water table and four feet below Approximate Original Contour (AOC). Ash generated off-site at the Trigen power plant in Golden and mine waste rock from other sites was permitted for placement in pits, and this activity continued for many years. The ash was placed five feet above the local ground water table and covered with six feet of overburden spoil and two feet of topsand.

Other Reclamation

The main facilities area was approved for an Industrial/Commercial postmining land use at the site. This area was released with SL-08.

The Dugout Pond, Sediment Pond 2, and associated drainage ditches have been approved to remain permanent. However, some facilities will be demolished per the PAP. The explosive storage facilities have been demolished. Monitoring wells will be sealed with a cement grout plug.

Water Rights and Usage.

Historically, two wells on the site were permitted with the Division of Water Resources (PAP, Section 2.03.10). One well was for domestic use and one for fire protection. Currently, no water usage is required for the reclamation activities.

Section II - Revisions to the Permit

Since the approval of the last permit renewal (RN-08) in April 2022, no permit revisions, technical revisions, or minor revisions have been submitted by CEC, and none have been approved by the Division. A bond release application (SL-11) was submitted on June 21, 2022 and approved on December 1, 2022. SL-11 was a Phase I application for a large part of the permit area; the total area was 101.28 acres. This action reduced the required surety of the Keenesburg Strip mine by $383,157.00.

Section III - Status of Stipulations

The stipulation history for the Keenesburg Strip Mine was reviewed as part of the midterm review. All stipulations associated with this permit and issued over the life of this operation have been complied with, forgiven, terminated, or withdrawn.

Section IV – Permit Variances and Specific Approvals

Variances to contemporaneous reclamation were granted during mining operations for the backfilling and grading of Pit A and Pit B. This was done to allow for ash disposal in these pits. Both activities (ash disposal and backfill/grading) have been completed at the site.

Section V - Enforcement Actions

No violations have been issued to this mine operator since 1994.

Section VI - Identified Issues and Required Revisions

Pursuant to 2.08.3, the Division has conducted a midterm review and has found that modifications are needed to ensure compliance with the Act and the Rules. CEC must submit a Minor Revision by June 28, 2024 to address the following:

- The reclamation cost estimate contained in Appendix S of the PAP will need to be updated based on the attached cost estimate by the Division.

Section VII – Reclamation Liability and Performance Bonding

A compiled reclamation cost estimate was developed by the Division as a part of the RN-08 process issued on May 24, 2022, and the total cost was estimated to be $1,201,563.00. A reduction in the required surety by $383,157.00 occurred with SL-11 issuance on January 3, 2023, reducing the total required surety to $818,406.00. The Division currently holds a corporate surety in the amount of $818,446.00 for the reclamation of the Keenesburg Strip Mine (issued by Travelers Casualty and Surety Co. of America).

The estimated reclamation costs have been updated with this Midterm Review. The Division now estimates the reclamation liability for mining operations to be $861,855.00, which is $43,409.00 more than the current bond held. Please see the attached Reclamation Cost Estimate.

The Division will be initiating a bond adjustment per Rule 3.02.2(4).

This concludes the 2024 Midterm Review of the Keenesburg Strip Mine.

COST SUMMARY WORK

Task description: **Cost Summary**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-000
User: RDZ

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
C02	Rip 10,480 feet of internal roads	RIPPER	1	6.49	$3,042
E01	Topsoil B-Pit (PII release Parcle 31,32,& 33)	SCRAPER1	1	48.38	$169,249
E02	Topsoil Long Term Spoil Area	SCRAPER1	1	77.41	$279,783
E03	Haul topsoil to "Other Areas" (parcel 42 and 43)	SCRAPER1	1	11.06	$24,460
E05	Haul topsoil to interior access roads	SCRAPER1	1	21.01	$46,451
F01	Seed 152.49 acres of disturbed area. (no PII bond rel)	REVEGE	1	70.00	$105,022
F01a	Seed 29.82 acres Phase II release (parcels 31,32,33)	REVEGE	1	15.00	$15,736
G01	Structural demolition	DEMOLISH	1	8.00	$4,416
H01	Seal 7 wells	BOREHOLE	1	16.00	$14,100
I01	Clean sediment from Pond 2, dispose in B-Pit	TRUCK1	1	1.38	$1,049
I02	water monitoring	SITEMAINTENANCE	1	30.00	$27,642
J01	Mobilization and Demobilization of Equipment	MOBILIZE	1	15.60	$25,345
		SUBTOTALS:		**320.33**	**$716,295**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$14,469
Performance bond:	1.05	Total =	$7,521
Job superintendent:	160.17	Total =	$10,424
Profit:	10.00	Total =	$71,630
		TOTAL O & P =	$104,043
		CONTRACT AMOUNT (direct + O & P) =	$820,338

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	$500	Total =	$500
Engineering work and/or contract/bid preparation:	0.00	Total =	$0
Reclamation management and/or administration:	5.00		$41,017
CONTINGENCY:	0.00	Total =	$0
		TOTAL INDIRECT COST =	$145,560
		TOTAL BOND AMOUNT (direct + indirect) =	**$861,855**

BULLDOZER RIPPING WORK

Task description: **Rip 10,480 feet of internal roads**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: C02 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-C02
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D9T - 9SU Horsepower: 405
Ripper Attachment: 3-Shank Ripper Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$238.76	NA
Operating Cost/Hour:	$162.29	100
Ripper Ownership Cost/Hour:	$18.32	NA
Ripper Operating Cost/Hour:	$8.98	100
Operator Cost/Hour:	$40.04	NA
Total Unit Cost/Hour:	$468.39	

Total Fleet Cost/Hour: **$468.39**

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA Bank Volume: NA BCY NA
Area: 4.80 acres Rip Depth (ft): 1.50 Volume: 11,616 BCY or CCY

Source of estimated quantity: Permit maps

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	1.50	feet/pass
Average Ripping Width:	7.67	feet/pass
Average Ripping Length:	500.00	feet/pass
Average Dozer Speed:	88.00	feet/minute
Average Maneuver Time:	0.25	minutes/pass
Production per unit area:	0.891	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production: 0.891 Acres/hr

Site Altitude:	4,000	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Adjusted Hourly Unit Production: 0.74 Acres/hr
Adjusted Hourly Fleet Production: **0.74** Acres/hr

JOB TIME AND COST

Fleet size: 1 Grader(s) Total job time: **6.49** Hours

Unit cost: $633.707 Per acre Total job cost: **$3,042**

SCRAPER TEAM WORK

Task description: **Topsoil B-Pit (PII release Parcle 31,32,& 33)**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: E01 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-E01
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G w/push-pull
-Dozer:	NA
Support Equipment -Load Area:	Cat D9T - 9SU
-Dump Area:	Cat D9T - 9SU
Road Maintenance –Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 3,500 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	100	100	25	25
Ownership cost/hour:	$255.23	NA	$238.76	$238.76	$149.33	$16.65
Operating cost/hour:	$280.59	NA	$162.29	$162.29	$23.20	$9.40
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	$0.00	$0.00	$0.00
Operator cost/hour:	$47.07	NA	$40.04	$40.04	$46.87	$38.91
Unit Subtotals:	$582.89	NA	$441.09	$441.09	$219.40	$64.96
Number of Units:	4	0	1	1	1	1
Group Subtotals:	Work:	$2,331.56	Support:	$882.18	Maint:	$284.36

Total work team cost/hour: **$3,498.10**

MATERIAL QUANTITIES

Initial volume: 76,343 CCY Swell factor: 1.060
Loose volume: **80,924** LCY

Source of estimated volume: Est. B-Pit Area, SL10 parcels removed
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,850 lbs/LCY
Material description: Sand - Damp
Rated Payload: 81,600 pounds
Payload Capacity: 28.63 LCY

Scraper Bowl (volume) Basis:

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY
Adjusted Capacity: **28.63** LCY

Cycle Time:

Scraper Loading Time: 1.00 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 4000 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:

Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1600.00	2.75	3.00	5.75	1477	1.16

Haul Time: **1.16** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1600.00	-2.75	3.00	0.25	2965	0.65

Return Time: **0.65** minutes

Total Scraper team cycle time: **3.41** minutes
Adjusted for job conditions: 836.28 LCY/Hour
Selected Number of Scrapers: 4 Scraper(s)
Adjusted single scraper team (unit) hourly production: 1,672.55 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **1,672.55** LCY/Hour

Unadjusted unit production/hour: 1,007.56 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **48.38** Hours

Unit cost: $2.091 /LCY Total job cost: **$169,249**

SCRAPER TEAM WORK

Task description: **Topsoil Long Term Spoil Area**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: E02 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-E02
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G w/push-pull
-Dozer:	NA
Support Equipment -Load Area:	Cat D9T - 9SU
-Dump Area:	Cat D9T - 9SU
Road Maintenance –Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 3,500 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	100	100	100	100
Ownership cost/hour:	$255.23	NA	$238.76	$238.76	$149.33	$16.65
Operating cost/hour:	$280.59	NA	$162.29	$162.29	$92.79	$37.60
%Utilization-ripper:	NA	NA	NA	0	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	$18.32	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	$0.00	$0.00	$0.00
Operator cost/hour:	$47.07	NA	$40.04	$40.04	$46.87	$38.91
Unit Subtotals:	$582.89	NA	$441.09	$459.41	$288.99	$93.16
Number of Units:	4	0	1	1	1	1
Group Subtotals:	Work:	$2,331.56	Support:	$900.50	Maint:	$382.15

Total work team cost/hour: **$3,614.21**

MATERIAL QUANTITIES

Initial volume: 123,965 CCY Swell factor: 1.060
Loose volume: **131,403** LCY

Source of estimated volume: Est. area of LTSP and Parcel 25
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,850 lbs/LCY
Material description: Sand - Damp
Rated Payload: 81,600 pounds
Payload Capacity: 28.63 LCY

Scraper Bowl (volume) Basis:

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY
Adjusted Capacity: **28.63** LCY

Cycle Time:

Scraper Loading Time: 1.00 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 4000 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:

Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1900.00	0.00	3.00	3.00	2800	0.97

Haul Time: **0.97** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1900.00	0.00	3.00	3.00	2949	0.79

Return Time: **0.79** minutes

Total Scraper team cycle time: **3.36** minutes
Adjusted for job conditions: 848.72 LCY/Hour
Selected Number of Scrapers: 4 Scraper(s)
Adjusted single scraper team (unit) hourly production: 1,697.44 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **1,697.44** LCY/Hour

Unadjusted unit production/hour: 1,022.56 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **77.41** Hours

Unit cost: $2.129 /LCY Total job cost: **$279,783**

SCRAPER TEAM WORK

Task description: **Haul topsoil to "Other Areas" (parcel 42 and 43)**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: E03 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-E03
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G w/push-pull
-Dozer:	NA
Support Equipment -Load Area:	Cat D9T - 9SU
-Dump Area:	Cat D9T - 9SU
Road Maintenance –Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 3,500 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	25	100	25	25
Ownership cost/hour:	$255.23	NA	$238.76	$238.76	$149.33	$16.65
Operating cost/hour:	$280.59	NA	$40.57	$162.29	$23.20	$9.40
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	$0.00	$0.00	$0.00
Operator cost/hour:	$47.07	NA	$40.04	$40.04	$46.87	$38.91
Unit Subtotals:	$582.89	NA	$319.37	$441.09	$219.40	$64.96
Number of Units:	2	0	1	1	1	1
Group Subtotals:	Work:	$1,165.78	Support:	$760.46	Maint:	$284.36

Total work team cost/hour: **$2,210.60**

MATERIAL QUANTITIES

Initial volume: 8,155 CCY Swell factor: 1.060
Loose volume: **8,645** LCY

Source of estimated volume: 2018 ARR
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,850 lbs/LCY
Material description: Sand - Damp
Rated Payload: 81,600 pounds
Payload Capacity: 28.63 LCY

Scraper Bowl (volume) Basis:

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY
Adjusted Capacity: **28.63** LCY

Cycle Time:

Scraper Loading Time: 1.00 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 4000 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:

Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2300.00	0.00	3.00	3.00	2800	1.12

Haul Time: **1.12** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2300.00	0.00	3.00	3.00	2949	0.93

Return Time: **0.93** minutes

Total Scraper team cycle time: **3.65** minutes
Adjusted for job conditions: 781.29 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 781.29 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **781.29** LCY/Hour

Unadjusted unit production/hour: 941.31 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **11.06** Hours

Unit cost: $2.829 /LCY Total job cost: **$24,460**

SCRAPER TEAM WORK

Task description: **Haul topsoil to interior access roads**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: E05 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-E05
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G w/push-pull
-Dozer:	NA
Support Equipment -Load Area:	Cat D9T - 9SU
-Dump Area:	Cat D9T - 9SU
Road Maintenance –Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 3,500 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	25	100	25	25
Ownership cost/hour:	$255.23	NA	$238.76	$238.76	$149.33	$16.65
Operating cost/hour:	$280.59	NA	$40.57	$162.29	$23.20	$9.40
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	$0.00	$0.00	$0.00
Operator cost/hour:	$47.07	NA	$40.04	$40.04	$46.87	$38.91
Unit Subtotals:	$582.89	NA	$319.37	$441.09	$219.40	$64.96
Number of Units:	2	0	1	1	1	1
Group Subtotals:	Work:	$1,165.78	Support:	$760.46	Maint:	$284.36

Total work team cost/hour: **$2,210.60**

MATERIAL QUANTITIES

Initial volume: 15,488 CCY Swell factor: 1.060
Loose volume: **16,417** LCY

Source of estimated volume: 2008 ARR
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,850 lbs/LCY
Material description: Sand - Damp
Rated Payload: 81,600 pounds
Payload Capacity: 28.63 LCY

Scraper Bowl (volume) Basis:

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY
Adjusted Capacity: **28.63** LCY

Cycle Time:

Scraper Loading Time: 1.00 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 4000 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:
Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2300.00	0.00	3.00	3.00	2800	1.12

Haul Time: **1.12** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2300.00	0.00	3.00	3.00	2949	0.93

Return Time: **0.93** minutes

Total Scraper team cycle time: **3.65** minutes
Adjusted for job conditions: 781.29 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 781.29 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **781.29** LCY/Hour

Unadjusted unit production/hour: 941.31 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **21.01** Hours

Unit cost: $2.829 /LCY Total job cost: **$46,451**

REVEGETATION WORK

Task description: **Seed 152.49 acres of disturbed area. (no PII bond rel)**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: F01 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-F01
User: RDZ

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Manure, delivery (average cost), per ton	0.03	ton	$2,631.64	$78.95
			Total Fertilizer Materials Cost/Acre	**$78.95**

Application

Description	Cost /Acre
Manure, tractor spreader (MEANS 32 91 13.23 4450)	$74.49
Total Fertilizer Application Cost/Acre	**$74.49**

TILLING

Description	Cost /Acre
	$
Total Tilling Cost/Acre	**$0.00**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Indiangrass - Cheyenne	1.50	4.57	$16.95
Switchgrass - Blackwell	0.50	4.47	$5.75
Blue Grama - Lovington	0.50	8.16	$7.99
Indian Ricegrass - Paloma	1.00	3.24	$11.13
Little Bluestem - Native	0.50	2.98	$6.78
Sideoats Grama - Butte	1.50	4.92	$13.50
Sand Bluestem - Garden Co.	2.00	5.19	$49.05
Sorghum, Hybr. Frg. - Bundle King IV	5.00	2.87	$3.63
Coneflower, Prairie	0.30	8.15	$9.90
Thickspike Wheatgrass - Critana	0.30	1.06	$2.06

Prairie Sandreed - Goshen	1.50	9.40	$15.53
Totals Seed Mix	14.60	55.02	**$142.26**

Application

Description	**Cost /Acre**
Drill Seeding (DRMS Survey Cost)	$232.00
Total Seed Application Cost/Acre	**$232.00**

MULCHING and MISCELLANEOUS

Materials

Description	**Units / Acre**	**Unit**	**Cost / Unit**	**Cost /Acre**
			$	$
Total Mulch Materials Cost/Acre				**$0.00**

Application

Description	**Cost /Acre**
	$
Total Mulch Application Cost/Acre	**$0.00**

NURSERY STOCK PLANTING

Common Name	**No / Acre**	**Type and Size**	**Planting Cost**	**Fertilizer Pellet Cost**	**Cost /Acre**
					$
				Totals Nursery Stock Cost / Acre	**$0.00**

JOB TIME AND COST

No. of Acres: 139.61
Estimated Failure Rate: 60%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $527.70
Cost /Acre*: $374.26

Initial Job Cost: **$73,672.20**
Reseeding Job Cost: **$31,350.26**
Total Job Cost: **$105,022**
Job Hours: **70.00**

REVEGETATION WORK

Task description: **Seed 29.82 acres Phase II release (parcels 31,32,33)**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: F01A State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-F01a
User: RDZ

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Manure, delivery (average cost), per ton	0.03	ton	$2,631.64	$78.95
			Total Fertilizer Materials Cost/Acre	**$78.95**

Application

Description	Cost /Acre
Manure, tractor spreader (MEANS 32 91 13.23 4450)	$74.49
Total Fertilizer Application Cost/Acre	**$74.49**

TILLING

Description	Cost /Acre
	$
Total Tilling Cost/Acre	**$0.00**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Indiangrass - Cheyenne	1.50	4.57	$16.95
Switchgrass - Blackwell	0.50	4.47	$5.75
Blue Grama - Lovington	0.50	8.16	$7.99
Indian Ricegrass - Paloma	1.00	3.24	$11.13
Little Bluestem - Native	0.50	2.98	$6.78
Sideoats Grama - Butte	1.50	4.92	$13.50
Sand Bluestem - Garden Co.	2.00	5.19	$49.05
Sorghum, Hybr. Frg. - Bundle King IV	5.00	2.87	$3.63
Coneflower, Prairie	0.30	8.15	$9.90
Thickspike Wheatgrass - Critana	0.30	1.06	$2.06

Prairie Sandreed - Goshen	1.50	9.40	$15.53
Totals Seed Mix	14.60	55.02	**$142.26**

Application

Description	**Cost /Acre**
Drill Seeding (DRMS Survey Cost)	$232.00
Total Seed Application Cost/Acre	**$232.00**

MULCHING and MISCELLANEOUS

Materials

Description	**Units / Acre**	**Unit**	**Cost / Unit**	**Cost /Acre**
			$	$
Total Mulch Materials Cost/Acre				**$0.00**

Application

Description	**Cost /Acre**
	$
Total Mulch Application Cost/Acre	**$0.00**

NURSERY STOCK PLANTING

Common Name	**No / Acre**	**Type and Size**	**Planting Cost**	**Fertilizer Pellet Cost**	**Cost /Acre**
					$
				Totals Nursery Stock Cost / Acre	**$0.00**

JOB TIME AND COST

No. of Acres: 29.82
Estimated Failure Rate: 0%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $527.70
Cost /Acre*: $374.26

Initial Job Cost: **$15,736.01**
Reseeding Job Cost: **$0.00**
Total Job Cost: **$15,736**
Job Hours: **15.00**

DEMOLITION WORK

Task description: **Structural demolition**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: G01 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-G01
User: RDZ

Agency or organization name: DRMS

UNIT COSTS **Location adjustment: 96.90 %**

Structure or Item Description	Dimensions	Demolition Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Powder magazine - cinder block walls	21' x 28' x 10'h	Bldg. (SN) demo./on-site disposal in existing pit or cut - Max. 10,000 ft. haul	5,880.00	CF	$0.24	$1,396.50
Powder magazine-concrete floor	21' x 28'	Demo. and on-site disposal in existing pit, 4 in. thick - Max. 10,000 ft. haul	588.00	SF	$0.84	$492.80
Skid mounted garage	28' x 26' x 18'h	Bldg. (SN) demo./on-site disposal in existing pit or cut - Max. 50 ft. push	13,104.00	CF	$0.20	$2,667.97

Job Hours: 8.00 **Subtotal (unadjusted): $4,557.27** **Total Cost (adjusted for location): $4,415.99**

BOREHOLE SEALING WORK

Task description: **Seal 7 wells**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: H01 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-H01
User: RDZ

Agency or organization name: DRMS

UNIT COSTS

Borehole Description	Sealing/Item Method	Diameter	Length	Quantity	Unit	Unit Cost	Total Cost
FPW1	Portland cement grout (Bag, material cost only...94 lb. bag)	8	60.5	17.80	bag	$19.95	$355.11
Water supply well	Portland cement grout (Bag, material cost only...94 lb. bag)	8	620	183.05	bag	$19.95	$3,651.85
DH96	Portland cement grout (Bag, material cost only...94 lb. bag)	5	55.58	5.93	bag	$19.95	$118.30
DH122	Portland cement grout (Bag, material cost only...94 lb. bag)	5	55.25	5.08	bag	$19.95	$101.35
SMW-2	Portland cement grout (Bag, material cost only...94 lb. bag)	4.75	97	10.17	bag	$19.95	$202.89
AMW-1	Portland cement grout (Bag, material cost only...94 lb. bag)	4.5	58.5	3.89	bag	$19.95	$77.61
AMW-2	Portland cement grout (Bag, material cost only...94 lb. bag)	6	49	8.47	bag	$19.95	$168.98
cut casing	Exposed casing removal - Calculate Circumference in Linear Feet	41.25	NA	129.59	LF	$4.55	$589.63
drill rig time	ATLAS COPCO ROC D7-11,4.0 in.	NA	NA	16.00	EA	$500.79	$8,012.64
water truck time	Water Tanker, 2,500 Gal.	NA	NA	16.00	EA	$34.27	$548.32
borehole markers	Borehole location/identification marker (EA, material cost only)	NA	NA	7.00	EA	$39.00	$273.00

Job Hours: **16.00** **Total Cost**: **$14,100.00**

TRUCK/LOADER TEAM WORK

Task description: **Clean sediment from Pond 2, dispose in B-Pit**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: I01 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-I01
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Generic 12-18 cy, 6x4
-Loader:	Cat 320D L 9'-6" Stick
Support Equipment -Load Area:	NA
-Dump Area:	NA
Road Maintenance –Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 3,500 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Excavator	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	NA	25	25
Ownership cost/hour:	$26.39	$70.85	NA	NA	$149.33	$16.65
Operating cost/hour:	$64.76	$50.01	NA	NA	$23.20	$9.40
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	NA	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	NA	$0.00	$0.00
Operator cost/hour:	$24.82	$46.87	NA	NA	$46.87	$0.00
Unit Subtotals:	$115.97	$167.73	NA	NA	$219.40	$26.05
Number of Units:	3	1	0	0	1	1
Group Subtotals:	Work:	$515.64	Support:	$0.00	Maint:	$245.45

Total work team cost/hour: **$761.09**

MATERIAL QUANTITIES

Initial volume: 486 CCY Swell factor: 1.000
Loose volume: **486** LCY

Source of estimated volume: Coors Site Plan; assume 4" deep sediment
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $0.00
Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 3,400 Pounds/LCY
Description: Sand and gravel - Wet
Rated Payload: 50,300 Pounds
Payload Capacity: 14.79 LCY

Truck Bed (volume) Basis:

Struck Volume:	12.00	LCY
Heaped Volume:	18.00	LCY
Average Volume:	15.00	LCY
Adjusted Volume:	14.79	LCY

Final Truck Volume Based on Number of Loader Passes: **14.20** LCY

Loading Tool Capacity

Bucket Size Class: Large

Rated Capacity:	2.080	LCY (heaped)
Bucket Fill Factor:	0.975	Loose material - mixed moist aggregates (95-100%) 0.975
Adjusted Capacity:	**2.028**	LCY

Job Condition Corrections: Site Altitude (ft.): 4000 feet

	Truck	Loader	Source
Altitude Adj:	1.000	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.830**	**0.830**	

Loading Tool Cycle Time: Number of Loading Tool Passes Required to Fill Truck: 7 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: ABOVE AVERAGE
Selected Value within this Basic Rating: AVERAGE

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): NA minutes

Cycle Time Factors		Factor (min.)	Source
Material:	NA	NA	(Cat HB)
Stockpile:	NA	NA	(Cat HB)
Truck Ownership:	NA	NA	(Cat HB)
Operation:	NA	NA	(Cat HB)
Dump Target:	NA	NA	(Cat HB)

Net Cycle Time Adjustment:	NA	minutes
Adjusted Loader Cycle Time:	**0.234**	minutes
Net Load Time per Truck:	**1.504**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.50	Minutes	Adjusted for site altitude:	0.500	Minutes
Truck Load Time:	1.504	Minutes	Adjusted for site altitude:	1.504	Minutes
Truck Maneuver and Dump Time:	0.90	Minutes	Adjusted for site altitude:	0.900	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	3400.00	1.00	3.00	4.00	2665	1.439

Haul Time: **1.439** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	3400.00	-1.00	3.00	2.00	2905	1.205

Return Time: **1.205** minutes
Total Truck Cycle Time: **5.548** minutes

Loading Tool unit Production 425.03 LCY/Hour Adjusted for job efficiency: 352.77 LCY/Hour
Truck Unit Production 153.53 LCY/Hour Adjusted for job efficiency: 127.43 LCY/Hour

Optimal No. of Trucks: 3 Truck(s) Selected Number of Trucks: 3 Truck(s)

Adjusted hourly truck team production: 382.28 LCY/Hour
Adjusted single truck/loader team production: 352.77 LCY/Hour
Adjusted multiple truck/loader team production: **352.77** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **1.38** Hours

Unit cost: $2.157 /LCY Total job cost: **$1,049**

SITE MAINTENANCE

Task description: **Water monitoring**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: I02 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-I02
User: RDZ

Agency or organization name: DRMS

UNIT COSTS

Maintenance Item	Hours per Year	Menu Selection	Quantity	Unit	Unit Cost	Total Cost
water monitoring	6.00	USER PROVIDED ITEM	10.00	1	$2,764.20	$27,642.00

Job Hours: 30.00 **Total Cost: $27,642.00**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mobilization and Demobilization of Equipment**

Site: **Keenesburg Strip Mine** Permit Action: MT8 Permit/Job#: C1981028

PROJECT IDENTIFICATION

Task #: J01 State: Colorado Abbreviation: None
Date: 4/22/2024 County: Weld Filename: C028-J01
User: RDZ

Agency or organization name: DRMS

EQUIPMENT TRANSPORT RIG COST

Shift basis: 1 per day
Cost Data Source: CRG Data

Truck Tractor Description: GENERIC ON-HIGHWAY TRUCK TRACTOR, 6X4, DIESEL POWERED, 400 HP (2ND HALF, 2006)

Truck Trailer Description: GENERIC FOLDING GOOSENECK, DROP DECK EQUIPMENT TRAILER (25T, 50T, AND 100T)

Cost Breakdown:

Available Rig Capacities	0-25 Tons	26-50 Tons	51+ Tons
Ownership Cost/Hour:	$20.26	$36.04	$47.05
Operating Cost/Hour:	$39.51	$76.08	$82.85
Operator Cost/Hour:	$22.52	$22.52	$22.52
Helper Cost/Hour:	$0.00	$23.53	$23.53
Total Unit Cost/Hour:	$82.29	$158.17	$175.95

NON ROADABLE EQUIPMENT:

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
Cat D9T - 9SU	66.13	$257.08	$175.95	1	$433.03	$175.95	$500.00
ATLAS COPCO ROC D7-11,4.0 in.	1.25	$217.10	$82.29	1	$299.39	$82.29	$250.00
CAT 14M	23.57	$149.33	$82.29	1	$231.62	$82.29	$250.00
Cat 637G w/push-pull	59.59	$255.23	$175.95	1	$431.18	$175.95	$1,000.00
Subtotals:					**$1,395.22**	**$516.48**	**$2,000.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Water Tanker, 2,500 Gal.	$73.18	1	$73.18	$73.18
Water Tanker, 3,500 Gal.	$93.16	1	$93.16	$93.16
Fuel Tanker, 6x4, 210 HP	$93.16	1	$93.16	$93.16
Lube Truck, 6x4, 250 HP	$93.16	1	$93.16	$93.16
Subtotals:			**$352.66**	**$352.66**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	BRIGHTON	
Total one-way travel distance:	20.00	miles
Average Travel Speed:	50.00	mph

Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$25,062.44
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$282.13

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.40	0.40
Return Time (Hours):	0.40	0.40
Loading Time (Hours):	3.50	NA
Unloading Time (Hours):	3.50	NA
Subtotals:	7.80	0.80

JOB TIME AND COST

Total job time:	**15.60**	Hours
Total job cost:	**$25,345**	